The status and future of heavy element research at Dubna

S.N. Dmitriev[1], Yu.Ts. Oganessian[1], M.G. Itkis[1]

[1] Flerov Laboratory of Nuclear Reactions, Joint Institute for Nuclear Research, Russia

dmitriev@flnr.jinr.ru

Relatively long half-lives of isotopes of elements 105-116 produced in reactions between ^{48}Ca and ^{248,245}Cm, ^{244,242}Pu, ^{243}Am and ^{238}U and chemical properties of the SHE predicted theoretically provide possibilities of new experiments devoted to the chemical identification of SHE, study of their chemical properties, combination of chemical and physical methods for the SHE synthesis and search for SHE in Nature.

The FLNR programme of the heavy element research for 2004-05 includes the following main experiments:

- Chemistry of elements 112 and 114: the ^{244}Pu(^{48}Ca,xn) reaction will be used; the adsorption of E112 and E114 (if E114 will have an enhanced volatility) on the Au surface will be determined in a temperature interval 25^{0}C to –200^{0}C.
- Chemical separation of recoil nuclei produced in the ^{243}Am(^{48}Ca,xn) reaction will be carried out for the ^{268}Db identification.
- Test experiments at the new FLNR separator MASHA (Mass Analyzer of Super Heavy Atoms) will be completed. First experiments on the determination of masses of isotopes of 112 and 114 elements will be carried out.
- Preparation of an experiment on the search for SHE (Z=108) in nature (study of Os-samples with a low-background neutron multi-detector).